

Basic and Advanced GLOBE Training Workshop Equipment and Supplies

Measurement	Instrument	Quantity Required
Atmosphere/Climate		
Cloud Cover/Type	GLOBE Cloud chart poster	2
Air Temperature - Max/Min Current Temperature	Digital multi-day maximum/minimum thermometer	5
	U-shaped, liquid-filled, maximum/minimum thermometer	2
	Calibration thermometer	2
	Instrument shelter (painted)	1
	Clawhammer	1
	Nails, assorted	0.5 kg
	Screws, assorted (some must be at least 2 inches long)	1 pkg.
	Screwdriver Set	1 set
	Cup hook	1
	14 inch crosscut handsaw	1
Precipitation, Liquid	Rain gauge	2
Precipitation, Solid	Snow board	1
Precipitation pH	pH indicator paper	See Water pH
	pH pen	See Water pH
	pH meter	See Water pH
	three pH buffers	See Water pH
Aerosols	Sun Photometer	5
	Digital Voltmeter	5
Surface Ozone	Ozone optical reader	5
	Ozone strips	20 (2 10-packs)
Relative humidity	Sling Psychrometer	5
	Digital Hygrometer	5
Barometric Pressure	Aneroid barometer	2
	Altimeter	2

Atmosphere Learning Activities	Variety of thermometers including at least five different types. At least 80% should measure air temperature. Some should read Fahrenheit only. None of the thermometers should include those already specified as part of the kit.	30 20 - international
	White 8 1/2 x 11 paper	1 per person
	Blue 8 1/2 x 11 paper	1 per person
	Glue sticks	See Land Cover/Biology, Biometry/Tree Height
	2-liter clear plastic bottles	2
	1-liter clear plastic bottles	2
	Modeling clay	1 package
	Soda straws, non-flexible type	5
	Food coloring	1 package
Atmosphere Learning Activities	30 cm metric ruler	1
Hydrology		
Turbidity	Secchi Disk	2
	Rope	5 m
	Turbidity tube and cap	5
Water temperature	Organic liquid-filled thermometer (calibration thermometer)	5
Dissolved Oxygen	Dissolved oxygen kit LaMotte	5
	250 mL polyethylene bottles with lids	10
Water pH	pH indicator paper	5
	pH pen, 2 point calibration	5
	pH meter	5
	pH buffers	2 of each pH (4, 7, 10)
Electrical conductivity	Electrode-type conductivity tester	5
	Conductivity calibration solution	2 bottles
Salinity - hydrometer Method	Hydrometers with jars	5
	500 mL clear plastic graduated cylinders	2
	Table salt in small dispenser	2
Alkalinity	Water alkalinity kit LaMotte	5
	Baking soda	1 box
Nitrate	Nitrate testing kit Hach No. 14161-00	5

	Potassium nitrate	1 bottle
Miscellaneous	Safety goggles	5 pairs
	Surgical gloves	1 box
	Plastic wash bottles	5
	Masking tape - 1 in. X 60 yd.	1 roll
	Jeweler's screwdriver/eye glass repair screwdriver (small)	3
	600 mL beakers	4
	100 mL clear plastic graduated cylinders	2
	Plastic cups	50
	2 gallon plastic pails with handles	10 (5 blue and 5 red)
	Rope, 1/4 inch diameter	58 m
Land Cover/ Biology		
Site layout	GPS receiver	5
	Orange surveyor tape	1 roll
	Compasses	5
	Survey flags	2 dozen
	Disposable camera	1
Species Identification	Dichotomous keys, eastern and western U.S.	5 of each
Tree circumference	50 m tape measure	5
Tree height	clinometer (student made)	0 (student made)
	Soda straws, non-flexible type	5 dozen
	8 1/2 x 11 in. Clear plastic sheet protectors	1 per person
	Glue sticks	15
	8 1/2 x 11 in. cardboard sheets	1 per person
Canopy cover	Densiometer (student made)	0 (student made)
	1 1/4 inch inside diameter PVC pipe x 5 inches	1 per person
	Electrical tape	5 rolls
	Duct tape (2" x 60 yards)	2 rolls
	Dental floss, cellophane tape, scissors	8 sets
	Metal washers, 1/4 inch diameter	2 per person
Grass Biomass	Grass cutting shears	5
	Acetate marking pens	5 sets

Soil		
Soil Characterization		
	Garden trowels	5
	Wooden chop sticks or golf tees	40
	GLOBE Soil color chart	5
	Flexible 1 meter tape	5
	Meter stick	5
	Plastic zip lock bags, 4 liter capacity (1 gallon)	4 boxes
	Clear plastic dropcloths 2 mil x 9 ft x 12 ft	4
	Disposable camera	1
	Spay mist bottles	6
	Dutch Auger (all sites)	2
	Bucket Auger (sandy sites only) (optional, send upon instruction only)	2 (optional, send upon instruction only)
	1.5 meter plastic sheets	4
	Plastic pails	11
	Nalgen acid bottle	2
	Distilled white vinegar	1 bottle (500 mL)
	Baking soda	1 box
Soil moisture	Survey flags	15
	Soil sample cans	36
	Masking tape - 1 in. X 60 yd.	1 roll
	Permanent markers	6
	Wood block 5 x 10 x 25 cm	2
	Hammer	2
	Compass	1
	Grass cutting shears	1
	0.1 g. accuracy Triple beam Balance 600 g capacity (International workshops only)	2 - international
	0.1 g. accuracy Electronic Balance 600 g cap. With 9v battery. (Domestic workshops only)	3
	Spare 9v batteries (Domestic workshops only)	3

	Microwave oven (Optional for international workshops, send upon instruction only . Voltage information will be provided)	1 1 - international (Send upon instruction only)
	Drying oven (soils) (Optional for international workshops, send upon instruction only. Voltage information will be provided)	1 1 - international (Send upon instruction only)
	Oven mittens	2
Soil Temperature	Taylor Dial or Digital Temp. Probe, 12 cm, Celsius	5 International send dial thermometers only
	Gutter spikes	5
	1/2 " diameter PVC pipe x 8 cm	5
	1/2 " diameter PVC pipe x 13 cm	5
	7/16' calibration wrench	5
Bulk density	White paper plates	100
	Mortar and pestle	1
	Rolling pin	1
	Sieve - number 10 with 2 mm openings	5
	Surgical gloves	1 box
	100 mL clear glass graduated cylinder	10
	Pocket calculators	5
	Nails	10
Soil pH	100 mL beakers	5
	Glass stirring rods	5
	pH meter	5
	pH buffers 4, 7, 10	1 each
	16 oz. Plastic wash bottles	5
	Plastic cups	20
	Plastic spoons	1 box
Particle size	Hydrometer (without jars)	7
	Organic liquid-filled thermometer	6
	500 mL clear plastic graduated cylinders	11
	600 mL beakers (at least 3 should be glass)	16

	Clear, heavy duty plastic wrap (Reynolds) - Unopened box	1 roll
	2-liter empty soda bottle	1
	Sodiumhexametaphosphate	1 250g bottle
Soil fertility	GLOBE Soil NPK kit	5
Soils Learning Activities	pH paper	4
	600 mL clear, colorless, glass beakers	4
	500 mL clear graduated cylinder	4
	1 mm nylon mesh screening, 50 cm x 50 cm	1
	1 liter clear, wide-mouth, colorless plastic soft drink bottles	4
	Scissors	1 pair
	Rubber bands	1 box
Unclassified Materials		
	2 inch clear, colorless tape	2
	Permanent markers, black	5
	Permanent markers, red	5
	Masking tape - 1 in. X 60 yd.	1 roll
	Paper towels, good strength	10 rolls
	Tote bags, 14 in. x 15 in. (approximately)	10
	Clipboards for 8 1/2 x 11 sheets	10
	2 in x 4 in wooden planks, each 2 feet long	4
	3 inch nails	20
	5 gallon plastic pails with lids	2